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THE BIRDS OF GREENLAND.

By JOHN CORDEAUX.

In 1875, just previous to the sailing of the last Arctic Expedition sent out by this country in the 'Alert' and 'Discovery,' Prof. Newton, at the request of the Admiralty, drew up his 'Notes on Birds which have been found in Greenland,' and these were printed in the large text-book issued at the time for the instruction of the Expedition.

This list of Greenland birds is a most complete one, and was compiled from every available source of information up to date, but chiefly from the excellent list by Prof. Reinhardt, printed in 'The Ibis' of 1861. In writing it Prof. Newton exercised a wise discretion in distinguishing between the accidental stragglers and the true denizens of the country—that is, birds which either breed there, or such as annually frequent it, in some part or other, for a longer or shorter period; and still further, to direct attention to those more northerly districts specially to be explored by the Expedition, the names of all such species as might reasonably be expected to be found north of Melville Bay, in Smith's Sound, and northward, were printed in a different type. The total number of species included in this list is 125, and of these no less than sixty-two must be considered nothing but stragglers to Greenland, and sixty-three, at the very outside, may be called residents; of these latter sixteen, or nearly one-fourth, are birds which do not occur within the Polar Circle, and cannot be considered true Arctic species; of the remaining forty-seven, recorded as inhabiting North Greenland,—their extreme northern extension being uncertain,—it was reasonable to expect, making the most liberal possible allowance, that thirty-six, or more probably about thirty, might be looked for in Smith's Sound and northward.

The actual number recorded by Col. H. W. Feilden, the Naturalist to the Expedition, as observed in Smith's Sound and northward, that is between the 78° and 83° of north latitude was twenty-four, and no addition was made to the lists by the sister ship, the 'Discovery'; these were all well-known Arctic forms included by Prof. Newton, in his excellent Manual: of the possible number of thirty-six enumerated, those not observed by the Expedition included the Grey Plover, American Golden Plover, Red-necked Phalarope, Purple Sandpiper, Sabine's Gull, Ross's Gull, Iceland Gull, Pomatorhine and Common Skua, Arctic Puffin, Red-breasted Merganser, and Snow Goose.

The actual number of birds, including stragglers, which are known to have occurred at Spitsbergen is about thirty species, and forty-six were recorded by the Austro-Hungarian Expedition at Jan Mayen Island, which lies about 400 miles N.E. of Iceland, or half-way between that island and Spitsbergen, during the thirteen months the members of the Expedition spent there in 1882–3. Amongst the number were such unexpected and unlooked-for visitors as the Redbreast, Tree Pipit, Fieldfares, Song Thrush, Blackbird, and Water Rail.

The only complete catalogue of Greenland birds published since 1875 is the one which has recently been compiled by Mr. Andreas T. Hagerup, a Danish mineral engineer, who was resident between two and three years in Southern Greenland, and his opportunities of recording the avifauna of the country have doubtless been greater than those of any other observer. The translation of the work, published in America, is edited by Mr. Montague Chamberlain, a well-known ornithologist, and one of the founders of the American Ornithologists' Union.*

In the Hagerup-Chamberlain catalogue there are some ten additional species which did not appear in Professor Newton's list, and several have not before been known to occur in Greenland. The first and largest portion of the pamphlet record the author's own personal observations on the local avifauna, when stationed from April, 1886, to October, 1888, at the mining settlement of Ivigtut, on the south side of Arsuk fjord, in lat. 61° 15′, and about ten miles distant from the sea. The second portion of his work is a "Catalogue of the Birds of Greenland," based on the works of Holböll, Reinhardt, Prof. Newton, Ludwig Kumlien, and others; use has also been made of the late Alfred Benzon's collection of bird-skins and eggs. This catalogue comprises all the birds discovered up to date in that part of Western Greenland which is settled by Danes, the country lying south of 73° N. lat.

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* 'The Birds of Greenland,' by Andreas T. Hagerup. Translated from the Danish by Frimann B. Arngrimson. Edited by Montague Chamberlain. 8vo. Little, Brown & Co., Publishers, Boston, U.S.A.

Of the ten most recent additions to the Greenland list, eight must be considered as mere chance visitors, and these may be dismissed without any further reference; they are interesting alone as showing the wanderings of birds: these are the Yellow-bellied Flycatcher and Canadian Warbler from North America,* the European Sky Lark, Steller's Duck, Velvet Scoter, European Coot, Siberian Gull, and Storm Petrel. The remaining two are residents during some part of the year and breeding; these are the Curlew Sandpiper,† stated to be "not uncommon in North Greenland. Breeds at Christianshaab, 69°." Considering the very great interest to ornithologists connected with the breeding-haunts and the yet unknown eggs of this species, the information conveyed in these few words must be considered vague and unsatisfactory. The other annual visitor—"a summer resident, breeding in both North and South Greenland"—is the Common Tern, *Sterna fluviatilis,* an abundant species both in North America and Europe.

The personal observations of Mr. Hagerup when resident at Ivigtut, from their originality and freshness, are of great interest to ornithologists. The Grey Sea Eagle appears very common in the district, particularly in the winter; on one occasion Mr. Hagerup saw fourteen on the fjord. Both the white and grey or dark form of the Greenland Falcon are equally represented. Mr. Hagerup, after an examination of a large number of specimens, thinks there is but one Gyrfalcon found in Greenland, and that the light-coloured birds breed chiefly in the north, and the dark are restricted to the southern districts, and that the two must be considered as geographical races. Their principal food in the winter consists of Ptarmigan. It seems somewhat remarkable that not a single living example of the Duck Hawk or Peregrine Falcon was observed by the author during his residence, as it is known to breed generally throughout Greenland. The Snowy Owl was considered a rare winter visitor. In the summer this fine Owl, which is a thoroughly circum-polar species, is most common in the extreme north; in 1876 no less than twenty-six nests of the Snowy Owl were found within fifteen miles of the 'Discovery' when stationed in the bay of that name in lat. 81° 42′. The Raven is very common all the year round, and from August to October they collect in flocks, sometimes as many as thirty, and devour great quantities of the berries of *Empetrum nigrum.* The lively little Wheatear is a common summer resident, arriving in May, and breeds in all suitable places. Greenland specimens average a larger size than those in Europe. Mr. Hagerup remarks that they appear to have learned one tune from the Snow Bunting, used by both the male and female at the nest, and that he has never heard the Danish Wheatears whistle that tune.

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* To these may perhaps be added a single example of *Totanus solitarius*, from a skin obtained by Mr. Benzon from Kangek (64° N. lat.), taken August 1, 1878.

† The *Tringa ferruginea*, Brünnich, or *T. subarquata* (Güld.), Bonaparte's Sandpiper, the *T. fuscicollis*, Vieillot, is said to be "not uncommon in the most southerly part of Greenland, where it probably breeds."

The most common of the small birds found in the vicinity of Ivigtut was the Greater Redpoll; this is the *Acanthis linaria rostrata* of American ornithologists, and the *Linota linaria*, or Mealy Redpoll of English authors, and must not be confounded with the Greenland Redpoll, *Linota hornemannii*, Holböll, which is resident throughout the year, breeding quite commonly north of 69°, and in winter moving to the south. The Greater or Mealy Redpoll is a summer visitor, arriving late in April and leaving in September. The nest, usually built wherever a bunch of bushes are found, is a very pretty object, of dried grass and roots, lined with plant-wool and often a few ptarmigan feathers, so as to look altogether white.

The domestic Sparrow was introduced into Greenland some years ago; in 1886 only five males were left, and in 1888 two. It is satisfactory to know that this pest has at last found a country too cold and wet for it, and that there is no risk of Greenland being overrun like the United States and Canada.

The most interesting of the avian visitors during the summer is the Snow Bunting. They arrive early in April, departing again about the middle of October. Mr. Hagerup has never seen one in winter; it is chiefly in April, when the country is still buried in snow, that their glorious song is most appreciated. In 1888 the earliest eggs were found on May 26th, the last on June 14th. All the nests found were built between stones, sometimes far in among the heaps. The Lapland Bunting was the least common of the songsters at Ivigtut; it frequents damp places covered with grass and bushes, but not observed higher than 200 feet above sea-level. In numbers it bore the following ratio to other small birds:—one to five of the Wheatears; one to twenty of the Snow Bunting; and one to thirty of the Redpoll. The song is short and of an extremely melancholy nature.

The number of Ptarmigan, *Lagopus rupestris* (Reinhardt), near Ivigtut is considerably increased in the winter by migrants from the north. In the first winter of 1866, a very severe one, about 400 were shot; in 1887, a mild winter, about double that number. They are very late in getting their summer dress, the females in June, and the males a month later, and they do not appear to acquire in the summer the black feathers of the breast, as do the males of our Scotch Ptarmigan, *L. mutus*.

Barrow's Goldeneye, *Clangula islandica*, is said to breed in small numbers as far north as 69° or 70°; it occurs near Ivigtut, but must be rare, as neither Danes nor Greenlanders knew it.

The beautiful Harlequin Duck is a summer visitor, and breeds quite commonly as far north as 69°; it arrives about April, and leaves again early in November. In summer the males collect in small numbers on the fjord.

The King Eider nests sparingly between 67° and 73° N., but north of 73° is more numerous. They arrived at Ivigtut about the middle of February in great numbers, and for the next four weeks were more plentiful than the Common Eider, but after this less in proportion till by the middle of April few remained. It is common in South Greenland in the winter. The eggs of the Greenland Wild Duck, *Anas boschas*, are considerably larger than those of the European bird.

The Kittiwake arrived at Ivigtut about the end of March or early in April, leaving again towards the end of October. Till the middle of May they keep together, and on clear days in April a flock of some two thousand will rise to a great height,—three or four thousand feet,—so as to be only recognised by their cries as they wheel around. The eggs are laid on the front of a perpendicular cliff during the first ten days in June; the earliest date for a young bird on the wing is August 7th. Their food in June is chiefly a small fish, *Mallotus arcticus*.

The young of the Glaucous and Iceland Gulls, when they leave the nest in August, gather on the flat tracts along the shore, and devour immense quantities of the berries of *Empetrum nigrum*. About one thousand pair of the latter nest on the "bird-cliff," at the head of the fjord, above the Kittiwakes, the lowest nests being built at the height of about 200 feet.

Brünnich's Guillemot breeds in great numbers north of 64°, and not improbably a little south of that line. It is a winter visitor to Ivigtut; in 1856, last seen May 30th, first returning on Nov. 9th. The Little Auk is also a winter visitor, arriving from its breeding quarters about the same time as Brünnich's Murre. The Black Guillemot of the west coast of Greenland appears to be identical with that of the Norwegian and North British shores, and is very common throughout the year. The Puffin of Greenland seems identical with the European *Fratercula arctica*. It breeds sparingly along the west coast, but is more frequent in the northern than southern division of the country. Two forms or geographical races of the Fulmar are recognised, *F. glacialis* and *F. glacialis minor*, the last breeding in vast numbers north of the 69th parallel.

To sum up, Mr. Chamberlain says that of the one hundred and thirty-nine birds, enumerated in Mr. Hagerup's list, fifty-three are purely accidental, and twenty-four so rare that they might be included in the same number, leaving sixty-one species that may be classed as regular inhabitants, resident, or remaining annually for a longer or shorter period in the country, and of these latter some are quite of uncommon occurrence.

It would, however, perhaps have been well, considering the very scanty evidence, to exclude altogether such doubtful occurrences amongst the birds of Greenland as that of the Tufted Puffin and the Pacific Eider.

THE INTRODUCTION OF THE MAGPIE INTO IRELAND.

By G. E. H. Barrett Hamilton.

I have recently come across two passages in the works of some old writers on the County Wexford, which throw some light on the manner and date of the first appearance of the Magpie in Ireland. As they appear to have hitherto escaped the notice of British naturalists, I think it may be well (before quoting and giving a reference to the passages in question) to shortly summarise the information which has been hitherto collected on the subject.

Mr. A. G. More, in the latest edition of his well-known 'List of Irish Birds,' describes the Magpie as "introduced from England previous to 1700," and this statement is no doubt based upon a study of the authors quoted by Thompson (vol. i. p. 328), and Yarrell (ed. iv. vol. ii. pp. 318—320), for some of which information we are indebted to the investigations of Ogilby. The account of the subject given by Yarrell is much fuller than that given by Thompson, as is only to be expected when it is remembered at what different dates these two standard works were published. In the former work several writers are quoted, *viz.*, Ranulphus Higden, who died about 1360; Derricke, who wrote in 1578; Robert Payne (1589); and Fynes Moryson (1617), whose united testimony bears witness to the absence of the Magpie from Ireland up to 1617. Then comes a gap of nearly a century, after which the curtain is lifted upon a vastly different scene, when Dean Swift, writing of Wexford in 1711,* notes that "Magpies have been always there, and nowhere else in Ireland, till of late years." After this the bird seems to have spread very rapidly. It was very common in Cork by 1746, and has now become resident and plentiful throughout Ireland.

The passages which I shall now quote throw considerable light upon the period referred to of about a century, through which the history of the Magpie in Ireland appears never yet to have been traced. The first of these is taken from Griffiths'

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* 'Journal to Stella' (Esther Johnson), letter xxvi, under date of July 9th, 1711.

'Chronicles of Wexford,'* a book which is now out of print. On page 39 it is stated that "in the year 1834, a Catalogue of Manuscripts, called 'The Southwell MSS.,' was put up for sale by Mr. Thos. Thorpe, containing descriptions of many Counties, and lesser divisions of Ireland, all of which were written for the use of Sir William Petty, when he was about to make his now celebrated 'Down Survey.'" One of these MSS., extensively quoted on pp. 49—56 of the 'Chronicles,' is an account of Wexford and the Barony of Forth, dated 1682, by Colonel Solomon Richards.† Among several other interesting natural history notes which the Colonel has left to us is one relating to Magpies on pp. 50, 51, which runs as follows:—"One remarque more is, there came with a strong bleake easterly wind, a flight of Magpies, under a dozen, as I remember, out of England, or Wales, as 'tis verilie believed, none having ever been seen in Ireland before. They lighted in the Barony of Forthe, where they have bredd, and are soe increased, that they are now in every village and wood in this county—especially in this Barony abundant—my own garden, though in the Towne of Wexford, is continually frequented by them, and they are spread more thinly into other counties and parts of the Kingdom. The natural Irish much detest them, saying, 'they shall never be rid of the English, while these Magpies remain.' The observation is, that the English Magpies entered Ireland in the same County where the Englishmen first entered it, and in the English Barony alsoe."

It is to be observed that Colonel Richards describes the Magpies from his own observation, and the accuracy of the words, "under a dozen, as I remember," gives the impression that he had himself witnessed their arrival. As to the way in which the introduction was effected, he supports Rutty, who wrote of the Magpie in 1772:—"It is a foreigner, naturalized here since the latter end of K. *James* the II.d's reign, and is said to have been driven hither by a strong wind." It would be interesting if this old tradition could still be found to exist among the inhabitants of the Barony of Forth, where the Colonel lived.

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* Published at Enniscorthy in (?) 1879.

† Colonel Richards is stated (on p. 57 of the 'Chronicles') to have lived at Badleigh, in Devonshire, before he came to Wexford. He continued in Cromwell's army up to 1656, and obtained a grant of lands in the county of Wexford, which was confirmed to him by Charles II. Other details of his life are also given.

The second passage confirms and supplements the information given by the first. It is taken from "A Chorographic Account of the Southern Part of the County Wexford. Written anno 1684. By Robert Leigh, of Rosegarland. (From the 'Kilkenny Archæological Journal.') Edited by Herbert F. Hore." This has been recently reprinted in the Wexford 'People' newspaper. After some remarks on the Baronies of Forth and Bargy, the writer says:—"About 8 years ago there landed in those parts a new sort of planters, out of Wales, a parcel of Magpies (forced, I suppose, by stormey weather), which now breed in severall places in ye Barony of Forthe, and at a place called Baldinstowne, in the Barony of Bargy, and in the wood off Rose Garland, before mentioned, in ye Barony of Shilmaleere."

Thus we have an exact and accurate statement that the Magpie first appeared in Ireland, in the County Wexford, about the year 1676. We have also to observe that the earliest writers who refer to this bird had heard nothing of its supposed introduction into Ireland by the English, but consider it to have arrived unaided. Of course it may have been introduced by man, but there is no proof that this was the case, and we shall be safe in describing the Magpie as having "first appeared in Ireland, in the County Wexford, about the year 1676."

ORNITHOLOGICAL NOTES FROM REDCAR FOR 1890-91.

By T. H. Nelson.

Ring Dotterels in 1890 commenced nesting early in April; single eggs were found on the 4th, and a clutch of four was taken on the 19th. I much fear that the colony of Cormorants at Kettleness is broken up by the propinquity of the railway, which now passes within a few yards of the cliffs. Two or three years ago there were about thirty pairs breeding, but last season I only saw one pair in several visits, and understand that they did not nest there. They may have changed their quarters to some of the other cliffs near Staithes. The Herring Gulls are as numerous as ever, and several Stock Doves were nesting on the cliffs.

Early in August two Grey Plovers, two Pigmy Curlews, and a Knot, all in perfect summer plumage, were obtained at the Tees-mouth; and a Richardson's Skua, an immature bird, was shot in Tees Bay on the 8th. On the 12th the usual shore-birds—Bar-tailed Godwits, Turnstones, Redshanks, Oystercatchers, Sanderlings, and Dunlins—were to be seen in small flocks. An immense flight of Pigmy Curlews—most unusual for this district—occurred this month. Small parties appear at irregular intervals, and three or four examples may be taken in a season; but on this occasion their numbers far exceeded anything in my experience. On the 26th twenty-one were killed, eleven at one shot, and from that date to the Sept. 25th, I saw no less than 110 which were shot at, or near, the Tees. On their first arrival they were found in flocks by themselves, on the salt-marshes, but after a few days they associated with Dunlins and other small waders. Those which were procured during the latter part of September were all shot by firing into mixed flocks of shore birds. The last I noticed were on the sands on Sept. 25th, nor did I afterwards hear of any others being observed. A few Sandwich and Lesser Terns visited the Tees Mouth, and one or two immature examples of the latter species were shot.

On Sept. 5th the first of the autumn contingent of Grey Plovers, a flock of six, passed to the N.W. 8th. A few young Gannets were in the Bay, and remained for some days fishing among the herrings and sprats. 10th. A flight of Grey Plovers, Sanderlings, Dunlins, and a few Godwits arrived. 11th. Great flocks of Godwits and Knots were on the Tees Sands. I made good bags of both species. 16th. E. moderate wind. A great many Ducks passed to the N.W. A Woodcock flew up the sands, near the fishing-boats, early in the morning. 20th. A great passage of Ducks took place. 23rd. At sea I observed eight Red-throated Divers. 26th. A great arrival of Dunlins; some immense flocks were on the sands at high tide. A few Larks and Chaffinches were crossing on the autumnal migration. 29th. Larks crossing continually. A Honey Buzzard was shot near Whitby, and sent to Mussell, the Middlesbro' taxidermist.

Oct. 2nd, N. wind, moderate. Several flocks of Ducks, a

Heron, and three Skuas passed East Scar. Larks continued to cross daily up to the 8th. 7th. E. wind, rain. An immature Grey Phalarope was shot while swimming among the breakers near Redcar Pier. 8th. N.E., moderate. A great many Ducks passed; a Woodcock was observed. 9th. S.W., light. A great rush of Larks and Green Plovers; they crossed from daylight up to noon. I noticed a white bird among some Larks, which passed me on Coatham Sands. 10th. An adult Buffon's Skua was killed by coming in contact with the telephone-wires on the sand-hills. The first Hooded Crows were seen to-day. This is a week later than the average date of their appearance. 10th to 14th. Larks crossing daily, and Ducks, reported by the fishermen, going to N.W. 13th. Guillemots and Razorbills, in flocks, were flying eastward in the early morning. A few Gannets, Terns, and Skuas, were still in the Bay. 15th. I saw six Shore Larks on East Scar, and a friend who was with me shot two, both fine adult examples. 17th. N.W., gale. Two Snipe came from seaward, and passed over the Scars. 18th. N. gale, rain. Many flocks of Ducks passed. I shot an immature Long-tailed Duck, and another was killed by a fisherman from East Scar. A Goosander and three small flocks of Pomatorhine Skuas flew to the N.W. 19th. N.E. gale, rain. Ducks passing. I saw five Shore Larks. 20th. S.W., light, rain. Many Dunlins and a few flocks of Ducks passed. 21st. S.W., light. A few Larks and Hooded Crows came over. 22nd. Calm, hazy. A rush of Larks, Hooded Crows, and Green Plovers. While off in a boat, E. of Redcar, I shot a Red-throated Diver with a few red feathers on the neck, and an adult Long-tailed Drake. 23rd. S.W., light. A few Hooded Crows and Larks crossed daily to the end of the month. I walked within two or three yards of a Shore Lark and an Arctic Tern, by the edge of the water. 24th. S.W., moderate. Many Larks and Hooded Crows. Two immature Velvet Scoters were shot. 25th. A large Hawk, possibly a Peregrine, carrying a bird in its talons, came from seaward at 10.30 a.m., flying S.W. It dropped the bird on the water, near Redcar Pier, and passed on up the sands about 200 yards away. A Kestrel came over at noon. 26th. N.E. gale. A large number of Skuas flew past to the N.W. 28th. N.W. gale. Two Long-tailed Ducks were shot. 29th. Gale continuing. A Little Grebe was picked up alive on Coatham Sands. A Woodcock was shot on the sand-hills. 30th. While looking through the telescope at the Lifeboat Station, I distinctly saw a Great Northern Diver swimming near West Scar; I went off in a boat, bnt could not then seen anything of the bird. On Nov. 8th a fine adult male example of this species was shot inside the rocks, and possibly this may be the bird I saw.

In November, between the 1st and 15th, S.W., light. A few Larks and Hooded Crows were observed daily. 18th. S.W., light, hazy. A great flight of Green Plovers. 24th. N., strong, rain. Two Shore Larks were shot on the sands east of Redcar. All those I saw were adult specimens. Several flocks of Ducks passed. 25th. N.E. gale, snow and hail showers. A great rush of Ducks, also many Snow Buntings. 27th to 29th. E. gales and snow. Many Ducks, Dunlins, Larks, and Snow Buntings passed.

On Dec. 1st an adult male Black-throated Diver, in almost perfect summer plumage, was shot within twenty yards of the beach, opposite Redcar. This is the first example in full plumage which I have known here. 2nd. While off in a boat I saw two Great Northern Divers and a large Grebe, but could not come within shot of them. 16th, E. gale, and 19th, S., moderate. A few flocks of Ducks passed. 20th. An intense frost. Three Swans flew past to the N.W. Thousands of Wood Pigeons congregated in the bean-stubbles east of Redcar. All the pools and water-courses on the marshes were frozen hard. 22nd. A Spotted Crake was captured alive in a ditch near Redcar. 27th. Two Swans were on West Scar early in the morning; five others were seen at the Tees Mouth. Many hundreds of Black-headed Gulls assembled on the shore during the severe weather in this month. 31st. A Little Auk was picked up on the beach. Unusual quantities of Scaups were obtained during December and January, many of them being drakes in perfect plumage. The old wild-fowlers say that, forty or fifty years ago, these birds were numerous every winter, and they hardly considered them worth shooting at; but they are by no means common now.

1891. On Jan. 7th a Whooper was shot near Stockton-on-Tees. Several Swans were killed by a puntsman at the Teesmouth while the hard weather prevailed. 8th. Hard frost. A great rush of Larks to the N.W. 9th. Fine, S.W., light. Three

Swans passed at sea, half a mile away, flying N.W. I do not think we had such severe frosts as were experienced further south, nor was there much snow. The little which did fall quickly melted on the coast-line, and throngs of Fieldfares, Redwings, Larks, Thrushes, and other small birds came down to the sands and fields near the beach; but the ground was frozen so hard that they could find but little sustenance, and many perished from starvation. 16th. My attention was attracted by the notes of some birds of the Lark tribe, at high-water mark, near the sand-hills. On shooting one I saw it was a "stranger," and forwarded it to Mr. Eagle Clarke, of the Edinburgh Museum, but afterwards procured two more, and then, by the aid of Mr. Saunders' 'Manual,' discovered they were Wood Larks (*A. arborea*). Probably they composed a family party, for there were only seven altogether. These are the first I have met with. Is it not an extraordinary time and place for birds of their nature? A local taxidermist, who has been in the habit of snaring song-birds since he was a boy, informs me that, although he has often looked for the Wood Lark, he never saw one until this winter; and Mussell has had only one through his hands in the course of thirty-five years' experience in the practice of taxidermy. 19th. A Scaup drake, swimming near the shore, induced me to take a boat, and go in pursuit. After winging the bird, which escaped by diving (though I secured it afterwards), I shot a strange-looking bird flying past the boat, and this proved to be a Great Crested Grebe; shortly after I obtained three Red-necked Grebes, besides seeing eight or ten others, and a Great Northern Diver, which I could not follow, owing to the cold snow showers, and darkness coming on. Two fishermen, who had heard the shooting, put off in their boat, and shot a Mute Swan and three Red-necked Grebes. They told me they had seen at least twenty. The weather became too rough for boating for some days after the 19th. Between that date and the 27th the fishermen reported most surprising numbers of Grebes at sea; there must have been some hundreds between the Tees and Huntcliffe. Two were picked up alive on the beach, having been driven ashore by the rough seas. 27th. An immature Black-throated Diver and two Red-necked Grebes were shot early in the morning. I went off about 10 o'clock, and obtained a Red-necked Grebe; we saw several more, but the wind rose and obliged us to come ashore. A few Larks and Green Plover came over. Wind, strong from S.W.

On Feb. 7th another Red-necked Grebe was shot, and four others, and a Great Northern Diver, observed early in the morning. 12th. N. gale, rough sea. Three Grebes were swimming near the shore, at low tide, under the shelter of West Scar. 14th. By the help of the telescope at the Lifeboat lookout, I discovered two fine adult Long-tailed Drakes swimming and diving near Salt Scar, and a Grebe near West Scar. 16th. Two Grebes were inside the rocks. 17th. An immature Black-throated Diver and a Glaucous Gull were shot from a boat between Redcar and Marske. 25th. A wounded Grey Lag Goose was brought in by one of the fishing-cobles. A Lark came over at 1 p.m. The weather during the last week of February was calm and foggy, the sea perfectly smooth. On the 27th I observed a Red-throated Diver within two yards of the shore, near East Scar; at one time, when it dived, there could have been little more than enough water to cover its back.

With regard to the abundance of Grebes this winter, it may probably be attributed to the severe frost which would freeze all the lakes and streams on the Continent, thus driving the Grebes to the open sea, and thence to our shores. Have any readers of 'The Zoologist' noticed an increase of these birds in their localities?

Since writing the above I have heard, in conversation with Messrs. W. J. Clark, of Scarborough, and M. Bailey, of Flamborough, that unusual numbers of Red-necked Grebes were seen in their respective districts in January last.

[A note on this subject by Mr. W. J. Clarke will be found in 'The Zoologist' for May last, p. 193.—Ed.]

ON THE HERPETOLOGY OF THE GRAND DUCHY OF BADEN.

By G. Norman Douglass.

(Continued from p. 184.)

II.—Fam. Scincidæ.

Anguis fragilis, L. — There is considerable fluctuation in the numbers of this species (as with some other reptiles) from year to year, dependent, perhaps, on whether the season has been favourable to the production and growth of the young. But, on the whole, a steady decrease has been perceptible up to the spring of 1889, notably near the capital, where it was formerly common enough both in the town itself and in the immediate vicinity.

I have always come across it fairly abundantly on the neighbouring hills, in the wooded parts, as well as more particularly in the large sandstone quarries,—where it can often be discovered under the same stone with a *Coronella lævis* or *Tropidonotus natrix*,—but never in the actual Rhine woods. Near Baden Baden it may be seen in great numbers, and, in fact, throughout the whole Black Forest region and on the Kaiserstuhl. In the Bavarian Palatinate it appears no less generally distributed, showing, however, a decided preference for the more hilly districts, though it also occurs in the plain directly opposite Karlsruhe.

Full-sized individuals are rarely met with, probably owing to the wholesale destruction which this species undergoes. Needless to mention that it is considered highly poisonous by the country people, who further accuse it of a special tendency to be swallowed by the grazing cattle (thereby causing their death), and act accordingly. But, apart from this, and the annual destruction involved in the hay-making, a multitude of more natural persecutors take advantage of its insufficient means of self-defence and tardy movements, which seem to suggest blindness. Hence the obscure tints which harmonize admirably, in a general way, with the surroundings.* But within this restricted sphere of variability there is so much individual variation that it has been said that no two of this species can be found coloured alike.

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* I may refer to a curious instance of more specialised protective resemblance in a species allied to this, given by J. v. Fischer. Speaking of the Skink, he says:—"The wonderful similarity in the coloration of its head to the surrounding sand [the other parts of the body being described as varying in colour] renders it extremely difficult to distinguish the heads peering out of the sand."

The upper surfaces of Baden specimens rarely exhibit any decided lines or vertical markings, being usually of uniform shades varying between iron-grey and dark brown, sometimes with a rich coppery iridescence. Lower surfaces grey or of a reddish hue,—throat sometimes almost white,—and the black colouring of these parts, characteristic of the young, is here almost entirely confined to the females, and is of comparatively rare occurrence. This sex is also more inclined to retain the immature black dorsal stripe, which remains most pronounced, as we should expect, in the anterior portions of the animal. I obtained two specimens of a pretty variety near the Donnersberg, in the Northern Palatinate: back of a uniform stone-colour, sides pink coral, down the centre of under surfaces a thin black stripe. In the Alps, both black and bluish coloration of the lower parts is much more frequent, though I have never seen the var. *cæruleoventris*—of a "light sky-blue colour"—described by Mr. Geisenheyner.* With specimens in alcohol this effect is often produced by the black pigment shining through the opaque medium of the loosened epidermis.

The *cyanopunctata* form, mentioned by the same author, occurs also in Baden, but not, apparently, in such abundance as at Kreuznach, and in all the specimens I have examined the characteristic blue spots are not, as elsewhere, continued along the sides and lower parts. They are indiscriminately scattered over the back, perhaps more thickly towards the head, each occupying half a scale or less. This peculiarity seems hereabouts to be confined to adults, and Mr. Haendel, who has paid special attention to this point, tells me that the majority are of female sex. The origin of this coloration appears at present obscure, but it is certain that it cannot be due to any external cause, abrasion, &c., as the blue spots not rarely form longitudinal lines along the surface of the back.

Order III. Ophidia.—Fam. I. Viperidæ.

1. *Vipera berus*, L.—The Smooth Snake, *Coronella lævis*, is responsible for many of the reports of the frequency of Adders

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* 'Wirbeltierfauna von Kreuznach,' 1888.

in some parts of the country. Its metallic coppery hue—the German popular "Kupfernatter" applies therefore equally to both—as well as the ferocity with which it resents attacks, are no doubt accountable for this confusion.

On the whole, I should call this species decidedly scarce (in comparison to other countries) in Baden, having not once met with it, even in the most suitable localities. Nüsslin* states that it is confined to the Black Forest with the river Murg as the northern boundary of its range, and he mentions the occurrence of the var. *prester* at Herrenwies, near Baden Baden.† At this latter place many claim to have observed it, but my belief has received a severe shock since a friend has written to say that after much trouble he succeeded in obtaining a "local" adder, which proved, however, to be merely a blindworm. I have myself spent several afternoons in looking for it on the rocks above the town, where it is said to be numerous.

Towards the eastern side of the Schwarzwald this species becomes more common, being reported as very frequent in the Swabian Hills; whereas in the entire central Rhine district it is referred to as scarce by all who have paid attention to this point. In the Bavarian Palatinate its presence has not yet been authenticated.

The colouring of this class of ophidians has been less influenced than that of others by the effects of "age, sex, season and locality"; terms which are often called into requisition to assist in explaining difficulties. This is partially true of the size, which varies both according to sex, the female being of larger dimensions, and locality, mountainous forms being somewhat smaller in size. I should consider it a mistake to attribute its absence in this part of Germany (as has been done) to the mildness of the climate, for on referring to a map, it will appear that its distribution has been determined by social rather than by physical causes, *i. e.*, that it has been less successful in its combat with other species than with the conditions of nature.

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* In 'Grosherzogthum Baden,' 1883.

† A local paper recorded the capture of a pair in July, 1887, near Weinheim, as a great rarity in that district. I note this because more recently it has been stated that the north of the Grand Duchy is entirely exempt from this species. Of course this may again be the result of an error of identification.

For while it is generally true that a large horizontal implies also a large vertical range, the causes which have led to this are by no means the same in all species. As at the high altitudes where *V. berus* is often found, its usual food—mice and other warm-blooded animals—no longer exists, it is obliged to content itself with a diet of the equally hardy *L. vivipara*, which will account to some extent for its dwarfed size.

There is little modification in the colour of this species during the growth of the individual, the adults remaining almost as brightly-coloured as the young. Relying entirely on its venom for self-defence, it has no need of positive protective colouring, as has been maintained, and it is pure chance if its tints are found to harmonize with the surroundings. This is sufficiently shown by the fact that hardly two are coloured alike, even out of the same brood. I have also not remarked any seasonal changes of colour in this species (after desquamation the hues are naturally more vivid); nor are there any pronounced sexual differences in colour, though some shades are more common to one sex.

Its varieties are unlimited, and have given rise to a great deal of confusion—witness many Italian herpetological works—between this species and *V. aspis*. There is much analogous, or parallel, colour variation between these two species, which are further structurally so bound together by a series of intermediate types that, according to some of the best authorities, no distinct line of demarcation can be drawn between them.

I am not aware that the red *Coluber chersea*, L., occurs in the Grand Duchy, but it does in other parts of Southern Germany, and I was interested to notice that it is accredited here, as in parts of England, with greater irritability than the other forms. It is noticeable that this colour is supposed, in other creatures also, to indicate the same temperament.

The black variety has been held to be peculiar to the female sex, probably because these exceed the males in numbers, and are less agile in escaping detection. It is found sporadically throughout the whole range of *V. berus*, but certainly in greatest abundance (though not exclusively), for some unexplained reason, in mountainous districts. I have caught one or two of the ordinary type above 8000 ft. elevation. This form has been known to produce young of the normal colour.

2. *V. aspis*, L.—The existence of this species in the extreme south of the Grand Duchy has at last been satisfactorily proved (see 'Zoologischer Garten,' 1890, p. 265), though it had been long suspected (ibid. p. 12). This isolated outpost has doubtless been reached from the Swiss Jura by way of Bâle, in the neighbourhood of which town it sometimes occurs.

In Western Germany it is cited from parts of Lothringen, but its distribution there is so far not accurately determined.

3. *V. ammodytes*, L.—A single specimen of this viper was caught, I think, about 1830, in Southern Bavaria, and served for the time to found its claims as a German species. These claims, however, have been shown to be null and void.*

Has any use been assigned to the curious little horn on the head of this snake? According to Leydig, it resembles in structure the wattles of gallinaceous birds, and we might infer from analogy that it served for the same purpose as those of different species of lizards. Similar protuberances are found on the heads of various other snakes, not the least remarkable being the double projection on that of the Cerastes viper, which, to judge by the shape of the head in other sand-inhabiting reptiles, would seem to be of considerable inconvenience to its owner. But its accompanying advantages must more than counterbalance this. Brehm suggests that these horns act as organs of touch, by informing the snake of dangers "which its eye, unaccustomed to the daylight, could not perceive." † They do not, however, appear to be particularly sensitive. It is also improbable, in view of the general adaptive tints of this species, that they should serve to inspire terror into the hearts of would-be persecutors.

Possibly they may be, as Mr. Wallace suggests of the Cobra's hood, ‡ a lawful means of warning, whereby to escape any "experimental tasting" on the part of its foes, and to judge by the difficulty we ourselves encounter in distinguishing poisonous snakes, such a mark of recognition would no doubt prove advantageous. Still, this would be crediting the hawks and other birds which might pounce down upon it with extremely acute powers of vision.

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* 'Leydig, 'Einheimische Schlangen,' 1883, p. 31.

† 'Reptiles,' p. 486. ‡ 'Darwinism,' p. 263.

It is a significant fact that a considerable amount of variety is displayed in the form of these excrescences, and that among the individuals of one species this characteristic sign is not constant in size, that of *ammodytes*, for instance, being often no larger than that of *V. aspis*. It may be asked how the acquisition of the slight nasal projection in this last named—which looks like a transitional stage—can be of any value to its possessor.

But this reminds me of the gradations in the means of warning by sound exhibited by various snakes, which are referred to in Darwin's "Expression of the Emotions,"* whence we may gather that so unpromising an object as the slightly indurated tail-tips of our European vipers may be the foundation of an organ as highly developed as that of the Rattlesnake.

It would be interesting similarly to follow up the various minute steps by which an apparatus so perfected as the poison-glands has been formed. But the greater the specialization—*i. e.* divergence in one direction—the rarer are the connecting links. Still we find here, as everywhere, various degrees of perfection, though it has become difficult to trace how the venomous saliva has been gradually accumulated, intensified, and collocated into its convenient receptacle. Dr. Leydig relates how on exhibiting a *Coronella lævis* to some students at Tübingen, the animal inflicted a bite on his wrist, which caused his whole arm to swell up for some days. In this he recognised the possible commencement of the development of these organs: a concession for so staunch an adherent of the immutability of species.

But it is still more curious to see how, while some species are improving this chance of success by increased swiftness or by various methods of protective coloration, others—locally separated and working independently, as it were—have discovered the identical, and not the least peculiar, of the many contrivances to prolong specific existence.

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* 'Darwinism,' p. 109 *seq.*

A COMPARATIVE LIST OF THE BIRDS OF HELIGOLAND AND THOSE OF THE BRITISH ISLANDS.

By Henry Seebohm.

The publication of the long-expected work by Heinrich Gätke, to which allusion has been already made (p. 216), enables the reader for the first time to realise the remarkable number of species of birds which have been found in the world-famed island of Heligoland, and to sift the actual captures from the more or less doubtful list of birds which have only been seen, or supposed to have been seen, on that wonderful little island.

Of the 396 species included in the list, there are more than 40 of which the evidence of their occurrence leaves much to be desired. In a few of these cases there seems to be some doubt whether the examples really were procured on Heligoland; and in some cases the examples have been lost, and their identification rests upon the memory of one of the brothers Aenckens, who recognised them years afterwards from skins. In many cases the birds were not captured, and the correctness of their identification cannot be proved. There are no fewer than 75 species which have only once been shot on the island, though in some cases it is supposed that other examples have been seen near enough for identification.

There are, however, nearly 300 species which have been procured more than once upon the island, a large proportion of which pass over regularly every spring and autumn, some of them occasionally in immense numbers.

The Heligoland list is very rich in the typical *Turdinæ* *Geocichla varia* appears in both lists, but the *G. sibirica* of the British list is replaced—on what seems to be very insufficient evidence—by *G. dauma*. The four British species of *Turdus* (or five if *T. migratorius* be included) have all occurred on Heligoland, and, in addition, three other American species appear in the Heligoland list — *T. swainsoni*, *T. pallasi*, and *T. fuscescens*, but the correct identification of the two latter is very doubtful. In addition to the three British species of *Merula*, three others are recorded—*M. fuscatus*, *M. ruficollis*, and *M. pallens*, but the identification of the last is unsatisfactory.

Erithacus rubecula is a common spring and autumn visitor to Heligoland. Three Bluethroats appear in the Heligoland list—*E. suecica* with the red spot is common in spring and autumn; *E. leucocyana* with the white spot was common in April, 1877, but is otherwise only known as an accidental visitor; and the so-called *E. wolfi* with no spot on the breast, which is generally supposed to be an accidental variety of the other species, was obtained in March, 1848. In addition to our Nightingale, *E. luscinia*, the larger species, *E. philomela*, has once occurred on Heligoland.

To the three British species of Flycatchers, a fourth, *Muscicapa albicollis*, must be added to complete the Heligoland list.

The genus *Pratincola* is represented by the same two species in both lists; but to the three British species of *Saxicola* three more must be added as stray wanderers to Heligoland—*S. aurita*, *S. morio*, and *S. leucura*, though some doubt attaches to the latter. The same remark applies to the genus *Ruticilla*. In addition to the two British species *R. mesoleuca* may certainly be added, and *R. moussieri* very doubtfully. In addition to *Monticola saxatilis*, *M. cyana* is included in the Heligoland list on the faith of an example caught about the year 1830, and identified years afterwards from memory.

Cinclus melanogaster is an occasional wanderer to Heligoland, as well as to the British Islands, but our resident rufous-breasted race is not known to have occurred on the little German rock.

To complete the Heligoland list of *Turdinæ*, two American species have found their way to the island, with or without the aid of ships—*Harporhynchus rufus*, in the autumn of 1836; and *Mimus carolinensis*, in October, 1840.

Both the Heligoland and British lists have claimed a *Pycnonotus*; the former is said to have been caught in May, 1837, and is recorded as the Palestine species, *P. xantopygus;* the latter was shot near Waterford, in January, 1838, and (if the skin has not been changed) was a South African species, *P. capensis*. The near coincidence of the dates is remarkable.

In the subfamily *Sylviinæ* the Heligoland list is specially remarkable. In addition to the 20 British species it contains 16 others. There can be no doubt that in August, 1856, a *Locustella certhiola* was shot on the island, having presumably wandered thither from Central Siberia; nor can it be denied that Gätke's collection contains an example of *Acrocephalus agri-*

cola, shot in June, 1864, which probably overshot the mark in migrating from its winter quarters to its breeding-grounds in South-east Russia. The genus *Hypolais* is only represented in the British Islands by one species, *H. icterina*, which has been twice shot in June—once in England and once in Ireland. In addition to this species the Heligoland list contains four species. An example of *H. polyglotta* was shot on the 23rd of May, 1846; one of *H. pallida* on the 20th of September, 1883; one of *H. caligata* on the 28th of September, 1851; and one of *H. olivetorum* in May, 1860. These four species all breed in Southern Europe. The four species of the genus *Sylvia* which visit the British Islands every summer, *S. atricapilla*, *S. hortensis*, *S. cinerea*, and *S. curruca*, pass over Heligoland every spring and autumn; and an example of *S. provincialis* is believed to have been caught half a century ago, and a second one seen in May, 1851. *S. nisoria*, which breeds in the south of Sweden, and has now occurred at least five times in the British Islands, is a rare and somewhat irregular visitor to Heligoland. *S. orpheus* has only occurred two or three times in either locality. *S. melanocephala*, like the last-mentioned bird, is a southern species whose claim to be inserted in the Heligoland list rests on a vague identification at least half a century old. There are two forms of *S. galactodes* — the western or typical form, and the eastern form, *S. galactodes familiaris*. It is rather curious that three examples of the former are recorded from the British Islands, whilst three of the latter are supposed by Gätke to have visited Heligoland.

In addition to the four British species of the genera *Phylloscopus*, *P. sibilatrix*, *P. trochilus*, *P. rufus*, and *P. superciliosus*, no fewer than eight are added by Gätke to the Heligoland list. One example of *P. bonelli* was shot in 1861, and a second in 1874, both in October, though the species breeds in Southern Europe. Two species breeding in North-east Europe, *P. borealis* and *P. tristis*, have been shot on Heligoland (the former in Oct. 1854, and the latter in Oct. 1846), as well as two Siberian species, *P. proregulus* and *P. coronata* (the former in Oct. 1845, and the latter in Oct. 1843). Three examples (one shot in Sept. 1878, the second in May 1879, and the third in June 1880) are identified by Gätke as *P. viridanus*, from Turkestan; and an example shot in October, 1867, is unquestionably *P. nitidus*, a species formerly supposed to be confined to the Himalayas, but now recorded as breeding in the Caucasus (Pleske, 'Vogelfauna Russ. Reichs.,' p. 174). Another Siberian species, *P. furcatus*, is reported as having been seen on the 24th of October, 1876.

An example of an American Warbler, *Sylvicola virens*, was killed on the 19th of November, 1858.

In the subfamily *Parinæ* it is very interesting to note the entire absence of any species of *Sitta*, and though *Parus palustris*, *P. borealis*, and *P. kamtschatkensis* are all included in the list, there is no satisfactory evidence to prove the occurrence of any one of them. As *Sitta cæsia* is unknown in Ireland, and *Parus palustris* is so very rare there, it is especially interesting to learn how seldom they venture across the sea. *P. major* and *P. cæruleus* are common, but *P. ater* is rare, and *P. cristatus* so rare that Gätke has not been able to get an example. *Acredula caudata*, *Panurus biarmicus*, *Certhia familiaris* and *Accentor alpinus*are rare; but *A. modularis*, *Troglodytes parvulus*, *Regulus cristatus* and *R. ignicapillus* are common, whilst *Tichodroma muraria* is unknown.

Ampelis garrulus, *Sturnus vulgaris* and *Pastor roseus* are severally irregular, common and rare in both lists.

All the British *Corvinæ* (eleven species, including *Pyrrhocorax alpinus*) have occurred on Heligoland, and possibly *Persicoreus infaustus* in addition.

In addition to the five British *Laniinæ*, *Lanius isabellinus* and *L. meridionalis* have each been once shot on Heligoland.

Heligoland is somewhat richer in *Fringillinæ* than the British Islands are, but some of the records are very unsatisfactory.

In addition to the ten Buntings which appear in the British list (four of them as accidental visitors) seven other species are claimed for Heligoland. Of these *Emberiza aureola*, which breeds in North Russia, has occurred several times; and *E. pithyornis*, which breeds in Central Siberia, has occurred once. From Southern Europe *E. cæsia* has occurred several times, *E. cia* twice, and *E. pyrrhuloides* once. *E. cinerea* from Southern Europe and *E. luteola* from Turkestan must be regarded as very doubtful additions to the Heligoland list, as they have not been procured.

Of the twelve species and subspecies of the genus *Fringilla* which have been caught in the British Islands, all, except *F. canaria*, are in the Heligoland list, and in addition several other species are supposed to have been seen—*F. nivalis*, *F. citrinella* and *F. pusilla*.

Passer domesticus and *P. montanus* belong to both lists. *Pyrrhula major* is a very irregular visitor to Heligoland, but has not been known to occur in the British Islands, whilst our common *P. vulgaris* has only once occurred on Heligoland.

Carpodacus erythrinus is a very rare visitor to Heligoland, as well as to the British Islands, and there is an example in the Gätke collection which is supposed to be a young bird of *C. roseus*, but there is no evidence that it has been compared with the young of the many allied species.

Pinicola enucleator, *Loxia curvirostra* (both thick- and thin-billed races) and *L. bifasciata* occur in both lists, but the American race of the latter is not known from Heligoland.

Two examples of *Dolychonix oryzivora* from North America have occurred on Heligoland.

The three British Swallows visit Heligoland, and in addition the South European *Hirundo rufula* has once occurred. *H. cahirica* is supposed to have been once seen, but, if not a dark-bellied example of *H. rustica*, the bird was probably *H. tytleri* from Siberia. The American *Progne purpurea* is not known to have occurred on Heligoland.

To the six British species of *Anthus* must be added two examples of *A. ludovicianus ;* and to the five British species of *Motacilla* must be added *M. citreola*, *M. borealis*, and, it is said, *M. melanocephala*, to complete the Heligoland list, but, curiously enough, Gätke does not distinguish the two last-mentioned species from each other.

In addition to the six Larks included in the British list, an example of *Alauda pispoletta* was shot in May, 1879 ; *A. calandra* is said to have been shot half a century ago, and an example of *A. tartarica* was shot in April, 1874.

Of the *Cuculidæ*, *Cuculus canorus* is the only species known to visit Heligoland, *C. glandarius* from Southern Europe, and *Cocyzus americanus* from North America, not having been known to have been procured.

The *Picidæ* are amongst the least migratory of birds ; they are almost unknown in Ireland. *Picus martius* and *P. tridactylus*, though both common in Scandinavia, are not known to have occurred either on Heligoland or on any of the British Islands ; *P. minor* is also unknown on Heligoland, and *P. leuconotus* and *Gecinus viridis* are only included in the list on the faith of a single example of each, neither of which was procured. *P. major* is the only Woodpecker known with certainty to have visited Heligoland. *Jynx torquilla*, though a regular summer visitor to England, and an accidental visitor to the Orkneys and Shetlands, has only once occurred in Ireland, and has not been recorded from Heligoland.

Upupa epops is almost as rare in Heligoland as in the British Islands.

Of the *Alcedinidæ*, *Alcedo ispida* is a rare and irregular visitor to Heligoland, and the American *Ceryle alcyon* is not known to have occurred there. Of the *Caprimulgidæ* both lists include *Caprimulgus europeus* as a regular visitor, and *C. ægyptius* as having once occurred. Of the *Cypselidæ* both lists include *Cypselus apus* as a regular visitor, and *C. melba* as an occasional straggler, but the British list also includes *Chætura cadacuta* in the latter category. Of the Meropidæ, *Merops apiaster* and *Coracias garrula* are included as more or less accidental visitors in both lists.

There are 27 birds of prey in the Heligoland list and 26 in the British list—*Falco sacer*, *F. lanarius*, *F. eleonoræ*, *Aquila brachydactyla* and *Circus pallidus* of the former taking the place of *Vultur fulvus*, *V. percnopterus*, *Elanoides furcatus* and *Accipiter atricapillus* of the latter list. It must, however, be noted that the evidence in favour of the four first-mentioned birds of prey having really visited Heligoland is very unsatisfactory.

The ten British Owls have all occurred on Heligoland, with the sole exception of *Bubo maximus*.

The Heligoland list is remarkably weak in Herodiones. *Ciconia alba*, *C. nigra*, *Ardea cinerea*, *A. purpurea*, *Botaurus stellaris* and *B. minutus* are common to both lists, but neither *Ardea alba*, *A. garzetta*, *A. comata*, *A. bubulcus*, *Nycticorax nycticorax*, nor *Botaurus lentiginosus*, has been recorded from Heligoland. An example of *Ibis falcinellus* was shot in 1824, but *Platalea leucorodia* has not been observed.

The three British Steganopodes—*Sula bassana*, *Phalacrocorax carbo*, and *P. graculus*—all visit Heligoland.

All the Heligoland Anseres belong to the British list,—*Cygnus olor*, *C. musicus*, *C. bewicki*, *Anser cinereus*, *A. segetum*, *A. brachyrhynchus*, *A. albifrons*, *A. minutus*, *A. hyperboreus*, *A. brenta*, *A. leucopsis*, *Anas boschas*, *A. acuta*, *A. strepera*, *A. penelope*, *A.*

circia, *A. crecca*, *A. clypeata*, *Tadorna cornuta*, *Fuligula nigra*, *F. fusca*, *F. perspicillata*, *F. marila*, *F. cristata*, *F. ferina*, *F. nyroca*, *F. clangula*, *F. glacialis*, *Somateria mollissima*, *S. spectabilis*, *S. stelleri*, *Mergus merganser*, *M. serrator*, and *M. albellus*, —but very few of the occasional visitors to the British Islands have been observed on Heligoland. We have no record of *Anser ruficollis*, *Tadorna rutila*, *Anas americana*, *A. carolinensis*, *A. discors*, *Fuligula rufina*, *F. albeola*, *F. histrionica*, or *Mergus cucullatus*. Probably some of these species have visited Heligoland, but have not been recognised.

The Tubinares are represented in both lists by *Fulmarus glacialis*, *Puffinus major*, *P. griseus*, *P. anglorum*, *Procellaria leachi*, and *P. pelagica*, but the British list also contains *Puffinus obscurus*, *Oceanites wilsoni*, and, if single occcurrences be admitted, *Daption capensis*, *Bulweria columbina*, *Œstrelata hæsitata*, and *Œ. torquata*.

The Heligoland *Charadriidæ* differ very slightly from those which visit Britain, except that fewer American visitors have been detected in the smaller area. *Totanus macularius*, *Tringa rufescens* and *Charadrius virginicus* appear in both lists; but the British list contains *Charadrius vociferus*, *Tringa bonapartii*, *T. pectoralis*, *Totanus bartrami*, *T. solitarius*, *T. flavipes*, *Macroramphus griseus*, and *Numenius borealis*, none of which have been known to occur in Heligoland. On the other hand, the British list boasts of a visitor from Southern Europe, *Vanellus gregarius*, but its absence in Heligoland is more than compensated for by the presence of *Numenius tenuirostris* and *Totanus stagnatilis*. The other species common to both lists are *Hæmatopus ostralegus*, *Charadrius minor*, *C. hiaticula*, *C. cantianus*, *C. morinellus*, *C. pluvialis*, *C. fulvus*, *C. helveticus*, *Vanellus cristatus*, *Himantopus avocetta*, *H. melanopterus*, *Phalaropus fulicarius*, *P. hyperboreus*, *Numenius arquatus*, *N. phæopus*, *Totanus pugnax*, *T. hypoleucus*, *T. ochropus*, *T. glareola*, *T. calidris*, *T. fuscus*, *T. glottis*, *Limosa rufa*, *L. melanura*, *Tringa canutus*, *T. subarquata*, *T. alpina*, *T. maritima*, *T. platyrhyncha*, *T. minuta*, *T. temmincki*, *T. arenaria*, *Strepsilas interpres*, *Scolopax rusticola*, *S. major*, *S. gallinago*, and *S. gallinula*.

Of the *Cursoriidæ*, *Cursorius gallicus* was shot rather more than half a century ago, but *Glareola pratincola* is not known to have occurred in Heligoland.

Of the *Œdicnemidæ*, *Œdicnemus crepitans* is common to both lists.

The Heligoland *Laridæ* are, as might be expected, very similar to those of the British Islands. *Larus glaucus*, *L. leucopterus*, *L. marinus*, *L. fuscus*, *L. argentatus*, *L. canus*, *L. tridactylus*, *L. ridibundus*, *L. minutus*, *Sterna cantiaca*, *S. arctica*, *S. hirundo*, *S. nigra*, *Stercorarius richardsoni*, *S. buffoni*, and *S. pomarinus*, bear somewhat the same relation to each other so far as numbers go in both areas, and the same may be said of the accidental visitors *Larus ichthäetus*, *L. bonapartii*, *L. sabinii*, *L. rossi*, *L. eburneus*, *Sterna caspia*, *S. anglica*, and *S. dougalli*. *Stercorarius catarrhactes* is a very rare visitor to Heligoland; *Sterna fuliginosa*, *S. leucoptera* and *S. hybrida* are not recorded from the little rocky island, but the absence of these southern species is compensated for by the occurrence of two examples of the Arctic species *Larus affinis*.

The Heligoland *Alcidæ* are the same as those in the British list, except that no record has been kept of the probable visits of *Alca impennis* during the last century, and there is an example of one of the allies of *Alca grylle* which remains undetermined in Gätke's collection for want of material with which to compare it.

Only two *Gallinæ* have occurred on Heligoland, *Perdix cinerea* and *Coturnix communis*, leaving *Tetrao mutus*, *T. scoticus*, *T. tetrix*, *T. urogallus*, *Phasianus colchicus* and *Perdix rufa* to the credit of the British list.

There is not nearly so much difference in the respective *Grallæ*. The following are found in both lists:—*Pterocles paradoxus*, *Otis tetrax*, *Grus cinerea*, *G. virgo*, *Rallus aquaticus*, *Crex pratensis*, *C. porzana*, *C. bailloni*, *C. parva*, *Gallinula chloropus*, and *Fulica atra*, leaving *Otis tarda* and *O. macqueeni* to the credit of the British list.

The Pygopodes are represented in both lists by *Colymbus glacialis*, *C. arcticus*, *C. septentrionalis*, *Podiceps cristatus*, *P. rubricollis*, *P. cornutus*, *P. nigricollis*, and *P. minor*, but *P. adamsi* appears hitherto to have escaped detection on Heligoland.

There can be little doubt that many more species remain to be discovered as more or less accidental visitors to Heligoland. The ornithological world is profoundly indebted to the inhabitants of Heligoland, especially to the untiring zeal of the Brothers Aenckens, for having detected so many rarities, and to the veteran Gätke for his careful records of observations extending over nearly half a century.

MEMOIR OF THE LATE DR. P. MARTIN DUNCAN, F.R.S.

It is with great regret that we have to record the death of Dr. P. Martin Duncan, which took place, after a long illness, at Gunnersbury, on the 28th May last, in the 67th year of his age.

Born in April, 1824, and educated at Twickenham College, Dr. Duncan entered King's College, London, as a medical student. He matriculated at the University of London in 1841, taking Honours in Anatomy and Physiology in 1844, and the degree of Bachelor of Medicine in 1846, in which year he qualified as a Member of the Royal College of Surgeons. After passing some time as assistant to Dr. Martin, of Rochester, he set up in practice by himself at Colchester, of which city he was subsequently elected Mayor.

Moving to London, he settled down at St. George's Terrace, Regent's Park, having been appointed Professor of Geology at King's College, a post which he held until the time of his death. He was always a busy man, and, when not occupied in preparing his lectures, devoted the whole of his leisure time to original research, making a *specialité* of fossil Corals and Echinoderms. On these subjects he published a considerable number of papers in the 'Annals and Magazine of Natural History,' the 'Geological Magazine,' the 'Quarterly Journal of the Geological Society,' the 'Quarterly Journal of Microscopical Science,' the 'Philosophical Transactions' and 'Proceedings of the Royal Society,' and the 'Journal of the Linnean Society.' In the last-named (vol. xxiii.) he published the latest and one of the most important of his papers, namely, his "Revision of the Echinoidea," occupying four number of the Journal.

But he by no means worked in this single groove, his attainments being of a comprehensive order, which fitted him, as occasion required, to deal ably with a great variety of zoological subjects. In 1878 he projected and edited a popular 'Natural History,' which was issued in parts by Messrs. Cassell, the publication of which, in six quarto volumes, was not completed until 1883. In this work he was materially assisted by the late Mr. W. S. Dallas, the late Prof. W. K. Parker, Prof. Boyd Dawkins, Dr. James Murie, Dr. H. Woodward, Prof. Seeley, Messrs. H. W. Bates, R. B. Sharpe, and other well-known specialists. The share which he himself took in its production extended far beyond the ordinary duties of an Editor. In vol. i. (Jan. 1878) he wrote the article Apes and Monkeys, and a portion of that on Lemurs. In vol. iii. (Dec. 1879) he wrote the sections on Edentata and Marsupialia. To vol. iv. (Dec. 1880) he contributed the articles on Reptilia and Amphibia. The Introduction to the Invertebrata in vol. v. (Dec. 1881) was his, as well as the articles Vermes, Zoophyta, and Infusoria, which appeared in vol. vi., published in Jan. 1883. Thus it will be seen that, besides being Editor, he was one of the largest contributors to this popular and very useful work.

Of less important publications mention may be made of a small octavo volume, 'The Sea Shore,' which was issued by the Society for Promoting Christian Knowledge, in 1879, as one of a series entitled 'Natural History Rambles.' Not confining his attention to the marine plants and animals which may be found on the beach, or in rock-pools, Dr. Duncan treated the subject from a broader point of view, so as to show, in a general way, the various directions in which sea-side rambles may be made interesting and instructive; and the ten chapters relating to animal life furnish an excellent summary of marine zoology, in which the appearance, habits, structure, and physiology of the animals dealt with are described with great clearness, and with an almost total avoidance of so-called hard words.

Dr. Duncan was also an occasional contributor to the 'Popular Science Review,' when under the editorship of his friend the late Mr. W. S. Dallas. In this periodical he published some extremely interesting and instructive articles, such, for instance, as his "Studies amongst Amœbæ," with two plates (1877); "Notes on the Ophiurans, or the Sand and Brittle Stars," with a plate (1878); and an examination of the opinions of Voltaire and Laplace regarding Geology (1880). In all these contributions we see the workings of a thoughtful mind, the notes of a serious reader, an earnest worker, and a sound teacher.

In 1881 the Geological Society awarded him the Wollaston Medal. He was a Fellow of the Royal, Linnean, and Geological Societies, and was a former President of the last named as well as of the Royal Microscopical Society. As a constant attendant at the evening meetings of all these Societies, until within a few months of his decease, his genial presence will be much missed by the many friends by whom he was there surrounded.

NOTES AND QUERIES.

MAMMALIA.

Natterer's Bat in Co. Donegal.—On the 12th June I found a specimen of this bat lying dead on a stone coping by a pond close to my hall-door. To make certain of the species, I forwarded it Mr. A. G. More, and presented it to the Dublin Museum. Acknowledging the receipt of it, Mr. More informed me that he had once received a specimen of this bat from Co. Cork a few years ago, and that previously it was only known in Ireland from a specimen procured in Co. Dublin. Donegal now makes the third Irish county in which it has been obtained.—H. CHICHESTER HART (Carrablagh, Co. Donegal).

[Our correspondent has overlooked several other Irish localities in Wicklow, Kildare, Queen's Co., and Cork, mentioned in an article on this species which was published with a life-sized figure of it in 'The Zoologist' for 1889, pp. 241—248.—ED.]

BIRDS.

The Wood Warbler in the Midlands.—In Mr. Montagu Browne's book on the Birds of Leicestershire and Rutland (noticed in 'The Zoologist,' 1890, p. 116), the Wood Warbler, *Phylloscopus sibilatrix*, is characterised as "a much rarer bird in the Midlands than is supposed," and Mr. Browne adds (p. 57) that he has not seen a specimen for five-and-twenty years. If so, either his opportunities for observation have been very limited, or he has failed to distinguish the Wood Wren from the Willow Wren. When viewed from a little distance, if the birds are silent, these two species, from their resemblance in size and colour, may perchance be confounded; but no one with an ear for music can possibly mistake the very different songs of these two little birds. Rambling lately in the neighbourhood of Sherwood Forest in company with a well-known observer, Mr. Whitaker, of Rainworth, near Mansfield, I was particularly struck with the abundance of Wood Wrens which on June 14th were in full song everywhere. They were commoner, in fact, than the Willow Wren, or perhaps it would be more accurate to say that the song of the Willow Wren was less frequently heard on this date than the song of the Wood Wren. Our method of observation on hearing the notes of the latter species was to approach very quietly until we could detect the author of the song, and then, adjusting our field-glasses, watch the bird in the act of singing. There could be no mistake at all about it; the pale green back, the silvery under parts, the long wings, and the characteristic song, all clearly indicated the species before us, and, in one wood, we noted the presence of at least eleven pairs. As Mr. Whitaker has found as many as seven nests of this bird in one day in the woods at

Rainworth, with the very characteristic eggs, so unlike those of the Willow Wren or Chiffchaff, we must conclude that Mr. Browne's opinion of the scarcity of the Wood Wren in the Midlands was based upon insufficient observation.—J. E. HARTING.

Hawfinch breeding in Devonshire.—With reference to Mr. Pidsley's statement that the Hawfinch has not been known to breed in Devonshire, and his reviewer's impression that the nest has been found by me in South Devon (p. 234), I should like to remark that a nest with young birds of this species was found, though not by me, some years ago near Kingsbridge. One of the old birds and two of the young ones were secured, and preserved, and are now in the possession of Mrs. Elliot, whose husband, the late Mr. J. Elliot, had a very good collection of Devonshire birds. For this information I am indebted to Messrs. Henry Nicholls and E. A. S. Elliot.—W. S. M. D'URBAN (Moorlands, Exmouth).

Habits of the Emu as observed in Confinement.—Amongst the miscellaneous observations published by Jesse from Gilbert White's MS. diary ('Gleanings in Nat. Hist.' 2nd series, p. 177) occurs the following:—"When horses, cows, sheep, and deer feed in wind and rain, they always keep their heads down the wind and their tails to the weather; but birds always perch and choose to fly with their heads to the weather to prevent the wings from ruffling their feathers." Amongst birds the Emu is an exception to this rule, as I have lately had an opportunity of observing. Mr. Whitaker, of Rainworth, near Mansfield, has some of these birds which have the run of a large enclosure, in company with Fallow-deer and a small flock of St. Kilda sheep. Here they do very well, and breed; and at the same time are tame enough to suffer a near approach—near enough to enable one to note the difference of colour in the irides of the old and young birds. When admiring them recently, during a visit paid to Mr. Whitaker, we remarked the habit of this species to sit tail to wind, like deer and sheep, and although the feathers were frequently ruffled by the wind, the birds suffered no apparent inconvenience from it. From this it may be inferred that the long pendulous plumage of the Emu affords as good a protection from the weather as the woolly fleece of a sheep, or the hairy covering of a deer.—J. E. HARTING.

Supposed Occurrence of Orphean Warbler in Devon.—I have just been reading up 'The Zoologist' for 1890, after more than a year's absence from England, and. at p. 467, I note the remarks on the "Supposed Occurrence of the Orphean Warbler in Devonshire," by Mr. W. S. M. D'Urban. From his description of the bird observed on April 16th, 1890, its smaller size, as compared side by side with the Blackcap, its pure white throat, and slender beak, I should say that the stranger was probably an adult Black-headed Warbler, *Sylvia melanocephala*. This (often called the

Sardinian Warbler, a misleading name, conducive to confusion with *Sylvia sarda*) is a common species in the South of France and the Peninsula (as well as in other parts of Southern Europe), and might easily be swept up with the tide of migration during a gale to our western shores. — HOWARD SAUNDERS (7, Radnor Place, Hyde Park, W).

Distribution of the Lesser Whitethroat in the S.W. of England.— In the review of Mr. Pidsley's "Birds of Devonshire," in the last number of 'The Zoologist,' my brother, Mr. G. F. Mathew, is quoted as an authority for the nesting of the Lesser Whitethroat (*Sylvia curruca*) in North Devon. He certainly was in error when he made this communication to the 'Naturalist.' I have myself never seen the Lesser Whitethroat either in Cornwall or Devonshire, to which counties it is only a chance visitant. Mr. Rodd regarded it as only an occasional migrant in the autumn. Mr. Gatcombe, my friend and constant correspondent for many years, wrote to me that he had never satisfied himself that he had seen the Lesser Whitethroat in South Devon. Colonel Montagu, who was familiar with this little bird, and had studied it closely in North Wilts, never met with it in Devonshire; and in some of his unpublished notes in my possession, in an account of a driving tour in West Somerset early in May, mentions the delight he felt in detecting a single Lesser Whitethroat on the beach at Minehead, as it was so great a rarity in that part of the kingdom. During the eleven years I resided at Bishop's Lydeard, in West Somerset, I only once saw a pair of Lesser Whitethroats, while my friend and neighbour, Mr. Cecil Smith, had only one local specimen in his collection, and had never been able to secure a nest. Where I now reside, at the extreme east of the county, close on the borders of Wilts, this species occurs regularly every summer, but it is far from common, my garden being the place where I usually see it. During the eight years I lived at Stone Hall, in North Pembrokeshire, I never came across a Lesser Whitethroat, nor did I ever see one in the S.W. of Wales; and the few instances I ever had reported to me of its occurrence were not trustworthy The following I copy from my MSS. notes on the Lesser Whitethroat in the S.W. peninsula:—"Although fairly common in the east of Somerset, and in the north-eastern parts of Dorsetshire, where Mr. Mansel-Pleydell says it is generally distributed, but not common, this little bird shuns the extreme West of England, being very rare in the west of Somerset and Dorset, and unknown in Devon and Cornwall, except as a chance visitor, or as a straggler with other birds in the flocks departing from this country in the autumn. Mr. Rodd states that it is only met with at Scilly occasionally in the autumn, and is unknown at other times in Cornwall. Dr. Bullmore writes, 'It is occasionally seen, but is not nearly so plentiful as the Common Whitethroat'; but I imagine that he is mistaken, and that Mr. Rodd's statement that this warbler never visits Cornwall is correct. Mr. Hill does not know of it in the Lizard district. Mr. D'Urban includes the Lesser Whitethroat among the birds which visit and nest in South Devon in the summer, but I suspect that here, too, is an error. Bellamy adds it to his South Devon list as 'rare.' In North Devon I have never seen it. Colonel Montagu never met with it in Devonshire, almost a decisive authority for its non-appearance. It is true that every year some change or other takes place in the distribution of birds, some which a few years since were rarely seen in a certain locality being now commonly met with; while others, which used to be frequent, have disappeared, owing to well-ascertained causes; but I do not believe that any change has affected the range of the Lesser Whitethroat to extend it further towards the west." By the way, Exmoor does not belong to Devonshire, for which county both Mr. Pidsley and the reviewer of his book seem to claim it.—MURRAY A. MATHEW (Buckland Dinham, Frome).

Hybrid Finches at the Crystal Palace Bird Show.—In Mr. A. H. Macpherson's note on this subject (pp. 188–9), no notice is taken of four remarkable mules, which caused amongst the judges considerable discussion. It is a general belief, I find, amongst "fanciers" that mules are always infertile, the singular argument put forth being that their fertility "would be against nature," whatever that may mean. The four birds in question were stated by Mr. Dye, who bred them, and with whom I have been in correspondence, to have been produced thus: three from a Linnet and Canary mule hen and a Canary cock, which (as might be expected) were almost indistinguishable from Canaries; and one from a Linnet and Canary mule hen and a Linnet cock, which was almost indistinguishable from a pure Linnet. The last-named was rather a weakly bird, and drooped one wing, from having been injured in the nest. I see no reason to doubt Mr. Dye's statement, and it is quite in accordance with several cases of fertility I have met with both among birds and mammalian hybrids.—J. JENNER WEIR (Chirbury, Beckenham, Kent).

Greater Shearwater and Dipper in Kent.—On October 29th, 1890, an adult male Greater Shearwater (*Puffinus major*) was found alive by a boy on the rocks at Ramsgate, and somewhere about the same time, or at any rate between that date and Christmas, a Dipper (*Cinclus aquaticus*) was shot on the rocks at Margate. The Shearwater was taken to Mr. Softley, who, by feeding it on fish, kept it alive until May 9th (more than six months), hoping that it would lay an egg, a futile hope, as it proved to be a male. The Dipper had a good pectoral band of chestnut, showing it belonged to the English species, which is only recorded as having occurred once before amongst the 'Birds of East Kent,' by Mr. Dowker, and the Greater Shearwater is not mentioned by him.—J. H. GURNEY (Keswick Hall, Norwich).

Spotted Crake at Scarborough.—I had recently an opportunity of examining a female specimen of *Crex porzana*, which was picked up dead on the railway, near Scarborough, on the morning of April 29th, having evidently flown against the telegraph-wires. It was in good condition, and the ovaries contained eggs in an advanced stage of development.—WILLIAM J. CLARKE (44, Huntriss Row, Scarborough).

FISHES.

Development of Fishes.—At a recent meeting of the Natural History Society of Glasgow, the last of the winter session, Prof. M'Intosh addressed the Society on "The Development and Life-histories of some of the Food-Fishes," and submitted a series of lantern-views illustrating the successive stages from the unfertilised ovum to the adult fish. In the course of the introductory remarks, he directed attention to three principal types of eggs, distinguished by having their protoplasmic contents simple or accompanied by few or many oil-globules. In the third type the numerous globules are sometimes grouped in the form of a circular band surrounding the protoplasm. Pelagic eggs, or those set free in the deeper water, differ essentially in many ways from ova deposited at the sea-bottom. The latter are subject to various disadvantages, such as liability to be swept from their resting-place and stranded, or destruction through the attacks of animal foes; and as they are generally deposited in clusters, and are occasionally brightly tinted, they are readily discovered by fishes, such as the Haddock, which prey upon the ova of other species. The eggs of the Lumpsucker, commonly found on our shores, are generally devoured by Rooks and Crows. On the other hand, pelagic eggs nearly always have a colourless yolk, and so escape unseen in the water. They ar carried about by the currents, and widely distributed throughout the shallower watars and bays. Taking the Cod as a type of the food-fishes, Prof. M'Intosh illustrated and described the various stages in its life-history. After fertilisation, the protoplasm streams towards one end of the egg, where it collects so as to form a cap-like disk. This, by a process of division and repeated subdivision, becomes enlarged and flattened, and ultimately assumes the form of the embryonic fish. The growth of the embryo, and the development of its eye, heart, liver, notochord, &c., were minutely described, and reference was made to the results of recent investigations successfully undertaken by Prof. Prince and others. After the young fish has emerged from the egg, its mouth remains closed, but it derives nourishment from the yolk-sac attached to attached to the abdominal part of the body, and carried about until it becomes wholly absorbed. The mouth then opens, and the fish begins to feed on the minute organisms which abound in the waters. Remarkable changes take place in the coloration of the growing fish. At one time the colour is distributed in dark bands, at another it is spread in small blotches, and still later it presents a chequered or tesselated appearance. Numerous illustrations of the development of other food-fishes were submitted for comparison, and attention was directed to the chief points of interest presented.

REPTILIA.

Average Length of Viper.—I should be very glad to know the average length of the adult Viper. Bell, in his 'British Reptiles,' does not give it, nor is it mentioned in Cooke's 'British Reptiles.' Early in May I found a Viper on the Quantock Hills, which measured twenty-five inches, but this seems an unusual size. This specimen was a fine "black" variety. Above, the colour was very dark, and the dorsal line almost black. The under parts were a glossy uniform black. The Viper was very torpid and very fat, from which I conclude that either it had just finished a full meal or was a female on the point of gestation. The countryfolk of Somersetshire have a profound belief that the bite of a Viper proves fatal on the anniversary of the day of its infliction.—E. P. LARKEN (Gatton Tower, Reigate).

[According to our experience, the British Viper usually does not exceed twenty or twenty-two inches, but some allowance must doubtless be made for the age of the specimens measured.—ED.]

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

May 24, 1889, *Anniversary Meeting.*—Prof. STEWART, President, in the chair.

Messrs. W. D. Crotch, C. Wilson, and Prof. R. Wallace were admitted Fellows of the Society.

The Treasurer presented his Annual Report, duly audited, and the Secretary having announced the elections and deaths during the past twelve months, the usual ballot took place for new members of Council, when the following were elected:—Messrs. C. B. Clarke, G. B. Howes, Arthur Lister, St. G. Mivart, and F. W. Oliver. The President and officers were re-elected.

The usual formal business having been transacted, the President proceeded to deliver his annual Address, taking for his subject "The Secondary Sexual Characters of Animals and Plants," of which he gave several interesting examples, illustrating his remarks with graphic sketches in coloured chalks. On the motion of Mr. H. Druce, seconded by Mr. C. Tyler, a vote of thanks was accorded to the President for his able address, with a request that he would allow it to be printed.

The Linnean Society's Gold Medal for the year 1891 was then formally awarded to Dr. Edouard Bornet, of Paris, for his researches in Botany, and, on his behalf, was presented to M. Raymond Lecomte, Secretary to the French Embassy.

The proceedings then terminated.

June 4.—Prof. STEWART, President, in the chair.

The following were elected Fellows: — Messrs. W. Somerville, H. S. Fergusson, W. F. Weldon, A. C. Jones, and L. A. Waddell.

After nominating as Vice-Presidents, Mr. A. W. Bennett, Dr. Braithwaite, Mr. F. Crisp, and Dr. St. G. Mivart, the President took occasion to refer to the loss which the Society had sustained by the recent death of a Vice-President, Prof. P. Martin Duncan, F.R.S. His genial presence at the meetings, no less than his valued contributions to the publications of the Society, would, he felt sure, be missed by everyone.

Sir Walter Sendall, who was present as a visitor, exhibited a curious cocoon of a moth belonging to the genus *Tinea*, and made some remarks on its construction and peculiar coloration.

The President exhibited a case of Lepidoptera and Coleoptera which he had selected to illustrate some of the more notable secondary sexual characters in insects, and made some interesting explanatory observations.

Dr. John Lowe exhibited some eggs of *Mantis religiosa*, which he had found adhering to the under-sides of stones on mountain-sides in the Riviera.

On behalf of Mr. J. Hanbury, Mr. W. H. Beeby exhibited and made remarks on a sterile form of *Ranunculus acris*, on which some criticism was offered by Prof. H. Marshall Ward.

A paper by Mr. M. C. Potter was read on diseases of the leaf of the cocoa-nut tree. The specimens examined had been received from Ceylon, through Dr. Trimen, and in Mr. Potter's opinion the diseases noticed were referable to three causes, namely, to the rays of the sun, to the ravages of insects, and to Fungi. These were separately considered, and descriptions were given of the different appearance which the leaves, thus variously affected, presented. A discussion followed, in which Prof. H. Marshall Ward criticised in some detail the observations which had reference chiefly to Fungi. Two papers followed, by Dr. P. H. Carpenter, on some Arctic *Comatulæ*, and on some *Crinoidea* from Madeira, upon which Mr. W. Percy Sladen offered critical remarks.

The President then gave an abstract of a paper which he had prepared on a hermaphrodite Mackerel, and exhibited the specimen on which his observations were founded, referring also to the recent cases of hermaphroditism in the Trout and Cod, which had been brought to the notice of the Society. A commentary by Prof. G. B. Howes brought the proceedings to a close.

ZOOLOGICAL SOCIETY OF LONDON.

June 2, 1891.—Prof. W. H. FLOWER, C.B., LL.D., F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of May, calling special attention to a female Water-buck Antelope, *Cobus ellipsiprymnus*, from British East Africa, presented by Mr. George S. Mackenzie, and to three Blanford's Rats, *Mus blanfordi*, from Kadapa, Madras, received in exchange, new to the collection.

Mr. Sclater made some remarks on the animals which he had noticed during a recent visit to the Zoological Gardens of Paris, Ghent, Antwerp, Rotterdam, Amsterdam, and the Hague.

Prof. Newton exhibited (on behalf of Prof. Stirling, of the University of Adelaide), a drawing, being the first received in Europe, representing the remarkable new Australian Mammal lately described by Prof. Stirling as *Notoryctes typhlops*, which was stated to be the Mole-type of the order Marsupialia. For a description see 'The Zoologist,' 1880, p. 424.

The Secretary (on behalf of Mr. F. E. Blaauw) showed some Long-tailed Tits shot in Holland, and sent to this country for the purpose of ascertaining whether they belonged to the British form, *Acredula rosea*, or the white-headed continental form, *A. caudata*. They were referable to the former.

Mr. F. Finn exhibited a hybrid Duck, bred in the Society's Gardens, believed to be bred between a male Chilian Pintail, *Dafila spinicauda*, and a female Summer Duck, *Aix sponsa*.

A communication was read from Dr. O. F. Moellendorff, containing a revised list of the Land and Freshwater Shells of Perak, with descriptions of some new speies.

A communication was read from Dr. G. E. Dobson, containing a sketch of the derivation and distribution of the Mammals of the order Insectivora found in the New World.

Mr. G. A. Boulenger read a report on Reptiles, Batrachians, and Fishes of which specimens had been collected for the West Indian Exploration Committee in some of the Lesser Antilles, and deposited in the British Museum.

A communication was read from Mr. Hamilton H. Druce, containing an account of the Butterflies of the family *Lycænidæ*, obtained by Mr. C. M. Woodford in the Solomon Islands.

June 16.—Dr. ST. GEORGE MIVART, F.R.S., Vice-President, in the chair.

Mr. H. A. Bryden exhibited an abnormal pair of horns of a cow Eland obtained in the North Kalahari, and made remarks on the structure of the feet of the Lechée Antelope.

Mr. Howard Saunders exhibited and made remarks on a nearly white skin of a Tiger obtained in Northern India by Major D. Robinson. Lieut.-Col. Godwin Austin remarked that he had once, many years ago, come across a white Tiger in India, but had failed to secure it.

Mr. Saunders exhibited specimens of the eggs of a Gull, *Larus maculipennis*, and of a Tern, *Sterna trudeaui*, from Argentina.

Mr. Sclater read an extract from a letter received from Dr. Bolau, describing two Sea Eagles living in the Zoological Garden, Hamburg, and considered to be referable to Steller's Sea Eagle, *Haliaëtus pelagicus*. One of these, received from Corea, Mr. Sclater pointed out probably belonged to the species described in the Society's 'Proceedings' by Taczanowski as *H. branickii*.

Dr. R. Bowdler Sharpe gave a short account of the proceedings of the International Ornithological Congress recently held at Budapest, in which he had taken part.

Mr. G. A. Boulenger read a paper entitled "A Contribution to our Knowledge of the Races of *Rana esculenta* and their Geographical Distribution." Mr. Boulenger proposed to recognise four forms of this widely-spread species of Frog, and pointed out the characters upon which these races were based and the areas which they occupy.

Mr. Oldfield Thomas read some notes on various species of Ungulates, which he had made during a recent examination of the specimens of this group of Mammals in the British Museum.

Mr. Edgar A. Smith gave an account of a large collection of Marine Shells from Aden. To this were added some remarks upon the relationship of the Molluscan Fauna of the Red Sea with that of the Mediterranean. A second communication from Mr. Smith contained descriptions of some new species of Shells, based on examples obtained during the 'Challenger' Expedition.

Mr. H. A. Bryden read some notes on the present distribution of the Giraffe south of the Zambesi, and made some remarks on the best means on procuring living specimens of this animal for European collections.

A communication was read from Messrs. Mole and Urich, containing notes on some of the Reptiles of Trinidad, of which they had transmitted living examples to the Society's Menagerie.

Mr. F. E. Beddard read some additional notes upon the anatomy of *Hapalemur griseus* made during a recent examination of two specimens of this Lemur.

Mr. E. B. Poulton, F.R.S., gave an account of an interesting example of protective mimicry discovered by Mr. W. L. Sclater in British Guiana. This was an immature form of an unknown species of Homopterous insect of the family *Membracidæ*, which mimics the Cooshie Ant, *Œcodoma cephalotes*.

This meeting closed the session.—P. L. Sclater, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

June 3, 1891.—Mr. FREDERICK DU CANE GODMAN, M.A., F.R.S., President, in the chair.

Mr. J. M. Ayde, of Somerford Grange, Christchurch, Hants, and the Rev. John Seymour St. John, B.A , of 42, Castlewood Road, Stamford Hill, N., were elected Fellows; and Mr. R. A. Dallas Beeching, was admitted into the Society.

Mr. E. B. Poulton exhibited living larvæ of *Endromis versicolora*, and commented on their habits.

Mr. W. F. H. Blandford called attention to the fact that the larvæ of *Liparis monacha* remained in small groups on the bark of the tree for about a week after emerging from the eggs, and that this fact was taken advantage of by the German foresters to destroy them. Also that he had himself verified the statement that uric acid can be detected in the malpighian tubes of insects. Mr. M'Lachlan agreed that the demonstration that the malpighian tubes were of the nature of renal organs was now satisfactory.

Mr. C. J. Gahan exhibited two species of Coleoptera that he considered to possess a mimetic resemblance, viz. *Estigmena chinensis*, one of the *Hispidæ*, and a nondescript Lamiid allied to *Pemptolasius*. He called attention to a peculiar structure of the antennæ in the latter by which the resemblance was increased.

Mr. J. W. Tutt exhibited a hybrid between *Amphidasis prodromaria* and *A. betularia*, obtained by Dr. Chapman. Mr. Stainton commented on the fact that the two insects appeared at different times; and Mr. Tutt stated that the *A. betularia* had been subjected to forcing, so as to cause it to emerge at the same time as *A. prodromaria*.

Mr. Tutt also exhibited forms of *Caradrina*, some of which he said were considered distinct on the Continent, though they were not recognised as such in this country, viz. *Caradrina taraxaci* (*blanda*), *C. superstes*, Tr., from Sligo, and *C. superstes*, H.-S., considered as synonymous with *superstes*, Tr., but apparently more closely allied to *C. ambigua*.

Mr. B. A. Bristowe exhibited varieties of *Arctia menthastri*, some of which had been fed on mulberry and others on walnut; no difference was observed in the variation.

Mr. G. Elisha exhibited larvæ in their cases of *Coleophora vibicigerella* and *C. maritimella*.

Mr. A. G. Butler communicated a paper entitled "Additional notes on the synonymy of the genera of Noctuid Moths."—DAVID SHARP, V.P., *Acting Secretary*.

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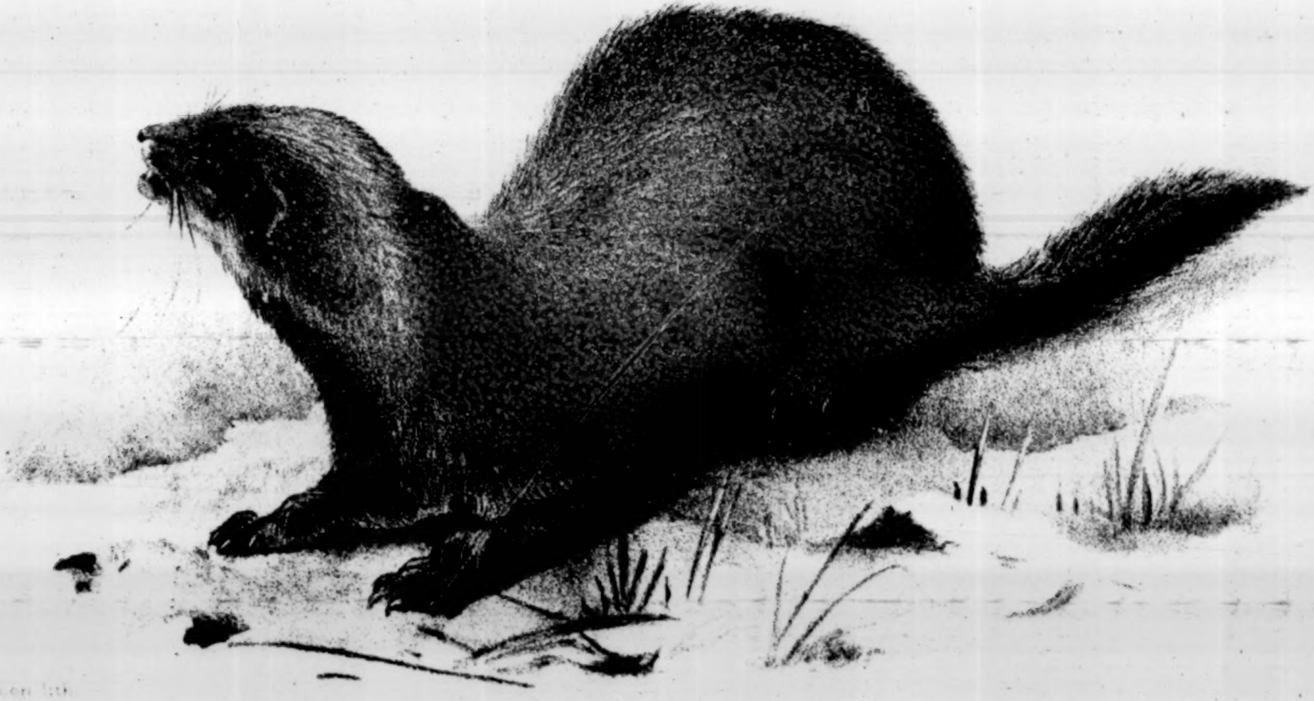

Hutchinson lith. West Newman

The Polecat

Mustela putorius, Linn.